

Information Systems

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IT372
Information Systems

Lecture 01



Module 1: An Overview



Chapter 1: An Introduction to Information Systems

Chapter 2: Information Systems in Organizations

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Information Systems (IT372)



An Overview:

- Information and System Concepts
- Information System (IS), its Functions
- Why Firms use IS
- Dimensions of IS
- Contemporary Approaches to IS
- Business Information Systems
- Electronic and Mobile Commerce
- Management Level Systems
- Enterprise Systems
- Collaboration Systems
- Summary





An Overview:

- Discuss why is it important to study and understand information systems
- Distinguish between data, information and importance of valuable information
- Discuss why organizations use Information Systems
- Identify the dimensions of Information Systems
- Identify Business Information Systems (E-business, Management Level, Enterprise, Collaboration)





- **Data:** raw facts, such as employee number, number of hours worked in a week, inventory part numbers etc.
- Alphanumeric data, Image data, Audio data, Video data
- **Information:** collection of facts organized so that they have additional value beyond the value of facts themselves
- **Process:** set of logically related tasks performed to achieve a defined outcome, or simply turning data into information.
- However, certain rules and regulations can be set up to organize data into useful and valuable information
- **Knowledge:** is the awareness and understanding of a set of information and the ways that information can be made useful to support a specific task or reach a decision



- **Characteristics of valuable information**
 - Accessible
 - Accurate
 - Complete
 - Economical
 - Flexible
 - Relevant
 - Reliable
 - Secure
 - Simple
 - Timely
 - Verifiable
- The value of information is directly linked to how it helps decision makers achieve their organization's goals



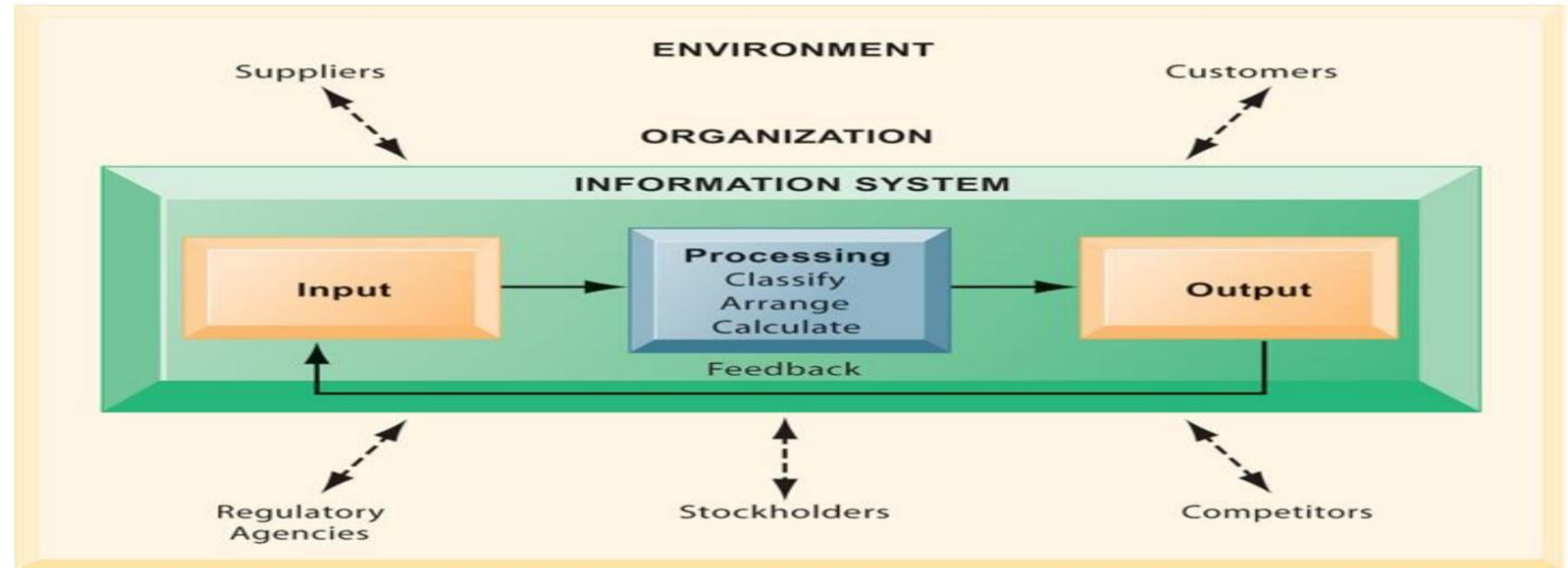
- **System:** is a set of elements or components that interact to accomplish goals
- The relationships among the elements determine how the system works
- Most systems are composed of smaller subsystems that support the larger system
- Changes in subsystems cannot be made without considering the effect on other subsystems and on the system as a whole.
- **Goal conflict** occurs when a subsystem's goals are inconsistent with the goals of another subsystem or with the system as a whole.
- **Goal congruence** occurs when a subsystem achieves its goals while contributing to the organization's overall goal.



- **Why is Information System important?**
 - We interact with IS personally and professionally
 - Transforming businesses
 - Globalization and Opportunities
- **IS effects all areas of the businesses**
 - Manufacturing
 - Accounting
 - Human Resources
 - Marketing
 - Top Management



- Set of interrelated components
- Collect, process, store, and distribute information
→ By computers and software as a tool
- Support decision making, coordination, control, problem analysis and create new product
- Provide solutions to changes/challenges in business environment
- **Another definition**
 - IS is an integrated Human-Machine system that combines hardware, software, databases and telecommunications networks. It collects data and processes it into information used for decision making at all levels of the organization.



An information system contains information about an organization and its surrounding environment. Three basic activities—input, processing, and output—produce the information organizations need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Environmental actors, such as customers, suppliers, competitors, stockholders, and regulatory agencies, interact with the organization and its information systems.



- **To achieve 6 strategic business objectives**



1. Operational excellence
2. New products, services, and business models
3. Customer and supplier intimacy
4. Improved decision making
5. Competitive advantage
6. Survival



- **Operational Excellence**

- Achieving higher levels of efficiency and productivity in business operations, plus changes in management behaviour
- Example: Wal-Mart's Retail Link system links suppliers to stores for in-time replacements

- **New Products/ Services/ Business Model**

- *Business model*: describes how company produces, delivers, and sells product or service to create wealth
- Information systems and technology a major enabling tool for new products, services, business models
 - E.g. Apple's iPod, iTunes online music business



- **Customer and Supplier Intimacy**

- Serving **customers** well leads to customers returning, which raises revenues and profits
- Intimacy with **suppliers** allows them to provide vital inputs, which lowers costs
 - E.g. JCPenney's information system which links sales records to contract manufacturer

- **Improved decision making**

- Managers need right information at right time
- IS provide real-time data for making decisions
- E.g. Verizon's Web-based digital dashboard to provide managers with real-time data on customer complaints, network performance, line outages, etc.
- Results in restoration and repairing fast and effective



- **Competitive Advantage**

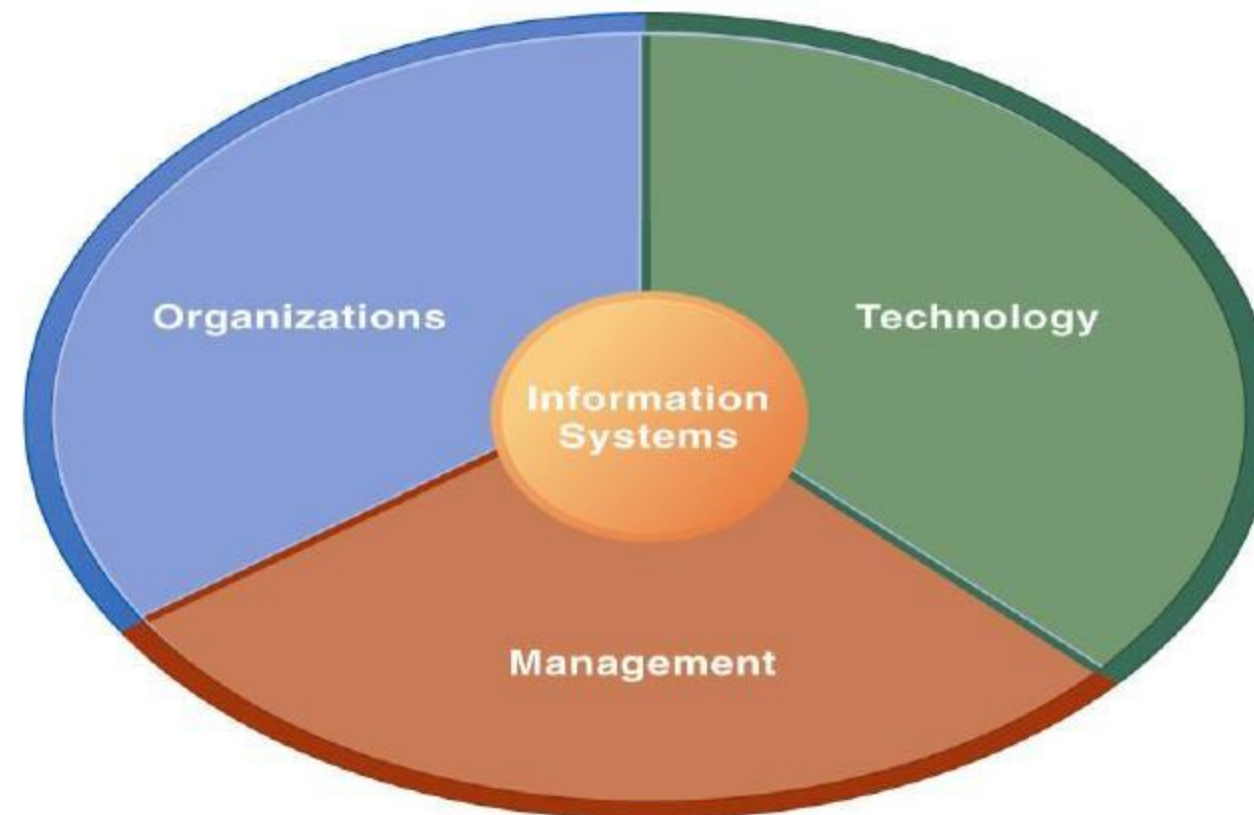
- Achieve higher sales and profit through using IS by:
 - Doing things better
 - Charging less for superior products
 - real time responding
- Using the internet is competitive advantage

- **Survival**

- Information technologies are necessity of doing business
 - Industry-level changes, e.g. Citibank's introduction of ATMs



- Using IS effectively depends on the understanding of organization , technology and management
- Only computer literacy is not important, rather broader IS literacy is important to implement a productive IS and this field of MIS is to achieve it



Information System Literacy
How and **Why** technology is
applied in business



- **Organization**

- Key elements : People, Structure, Business Processes, Politics, Culture
- Organizational structure has different levels and specialities





- **Management**

- Make decisions, formulate action plan and solve organizational problem
- Managers set organizational strategy for responding to business challenges
- In addition, managers must act creatively:
 - Creation of new products and services
 - Occasionally re-creating the organization





• Technology

- **Hardware:** physical equipment used for input, output, processing, storage
 - E.g. Event Data Readers (EDR) in vehicles
- **Software:** computer programs that control and coordinate the hardware
 - E.g. Fab Lab – controls automatic cutter, milling machines
- **Data management technology:** deals with software that are used to organize data on physical storage media
- **Network and telecommunications technology:** contains both hardware and software that are used to link various computer devices
 - E.g. investment firms use telecomm to connect with brokers and traders
- **Internet:** worlds largest Network
- **WWW:** service provided by the internet
- **IT infrastructure:** platform to build the IS



- **Company:** United Parcel Service (UPS)
 - Package delivery
 - Started in 1907, now has 408,000 employees and 96000 vehicles
- **Process:** automated package tracking system
 - Scannable label attached to package
 - Info from “smart” tag goes to central computer
 - At centre traffic route made for drivers
 - Delivery Information Acquisition Device (DIAD) access info through wireless n/w
 - Through bar code info at various points goes to central computer
 - Info available on UPS website



- **Inputs, Processing, Output of UPS PTS**

- Info about sender, destination and time of arrival, progress data
- Info transmitted central computer to distribution centre, route calculation
- Tracking status, printed label, driver's route

- **Technologies used and why**

- Handheld computers, bar code scanners, wireless communications, desktop computers, UPS data storage technology, UPS tracking software, Internet (Web site)
- Reason: high level service in low price



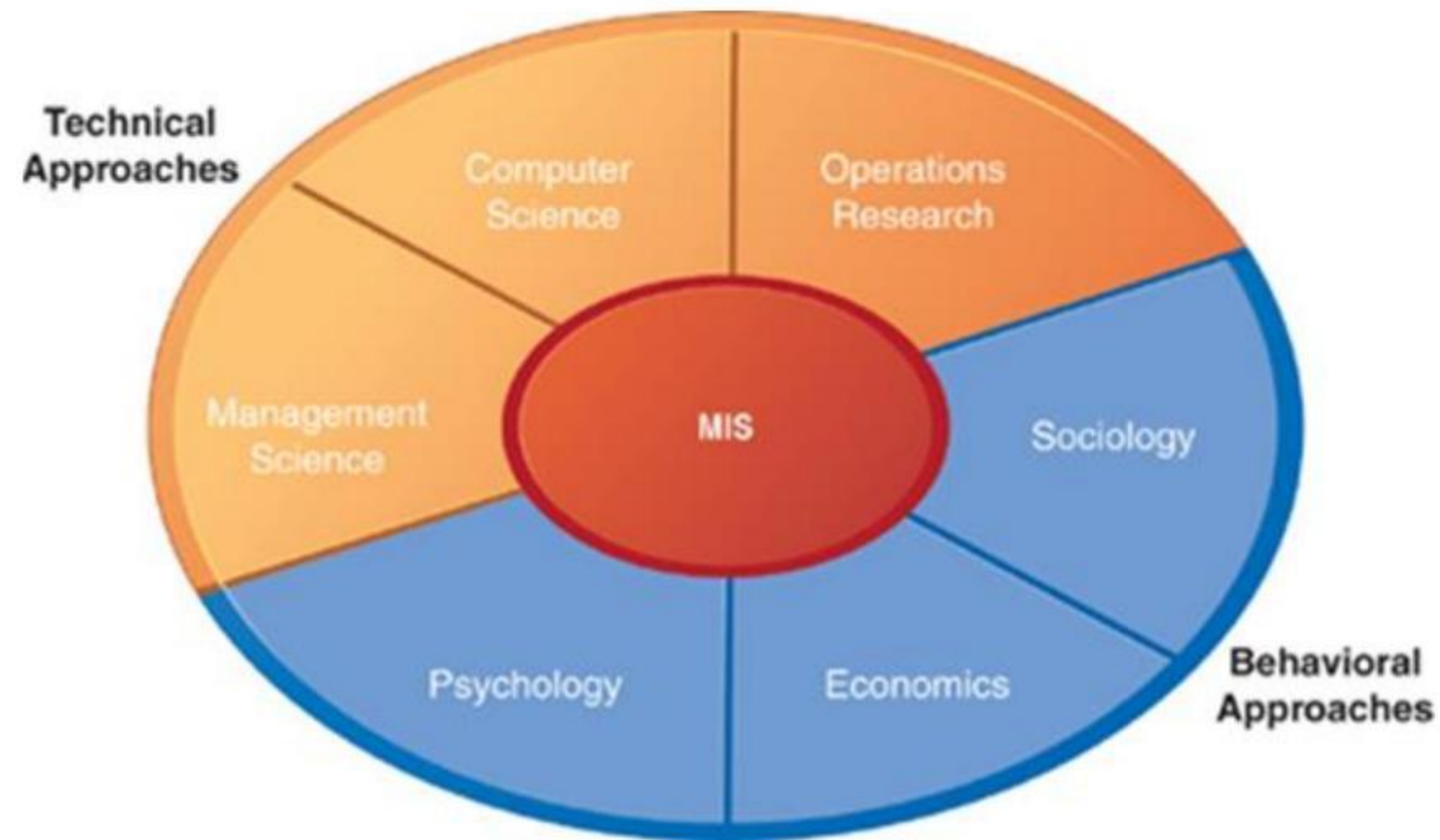
- **Strategic Business Objectives Achieved**
 - Operational Excellence
 - Customers and download and print labels
 - Drivers traffic route
 - Customer Intimacy
 - Inform about estimated time
 - Package status report
 - New Service
 - Point Sales Order Management System (OMS)
 - Competitive Advantage
 - Achieved by above mentioned implementations



- Globalization has impact on organizations and its IS
- Thomas Friedman “The World is Flat”
- Individuals from all over the world compete with other individuals, companies and countries through Internet
- Where there are International opportunities, there are challenges and obstacles as well
 - Cultural and language challenges
 - Time and distance challenges
 - Infrastructure challenges
 - Currency challenges
 - Technology transfer issue
 - Product and Services challenges



- **IS is a multidisciplinary field**



The study of information system deals with issues and insights contributed from technical and behavioural disciplines



- **Technical approach**

- Emphasizes mathematically based models
 - Computer science theories of commutation ,data storage
 - management science: models of DM and practices
 - operations research: optimizing selected parameters of org.

- **Behavioural approach**

- Behavioural issues like strategic business integration, design implementation, management
 - Psychology: how decision makers use formal information
 - Economics: how IS change the control and cost structures
 - Sociology: how system affect individuals and groups



- **The sociotechnical systems**

- Use of computer-based information systems in business firms
- Combines work of CS, management, and operating research toward developing system solutions to real word problems
- Concerned with behavioural issues of development, use and impact of IS

- **main actors**

- Suppliers of hardware and software
- Business firms
- Managers and employees
- Firm's environment (legal, social, cultural context)

- **Key: training, learning and planned change**



- **Purpose:** help employees in organizations accomplish routine and special tasks
- Different IS support different interests, specialities and levels in the organizations
- **e-commerce, m-commerce**
- **Management Level Systems**
- **Enterprise Systems**
- **Collaborative Systems**



- **E-business:** refers to use of digital technology and Internet to execute the major business processes
 - Accounting, finance, manufacturing, HR activities,
 - E-business strategy is flexible and adaptable
- **E-commerce:** any business transaction (buying and selling) executed electronically
 - B2B, B2C, C2C
 - Also offers opportunities for small businesses
- **M-commerce:** transactions happening anywhere, anytime (using wireless communications)

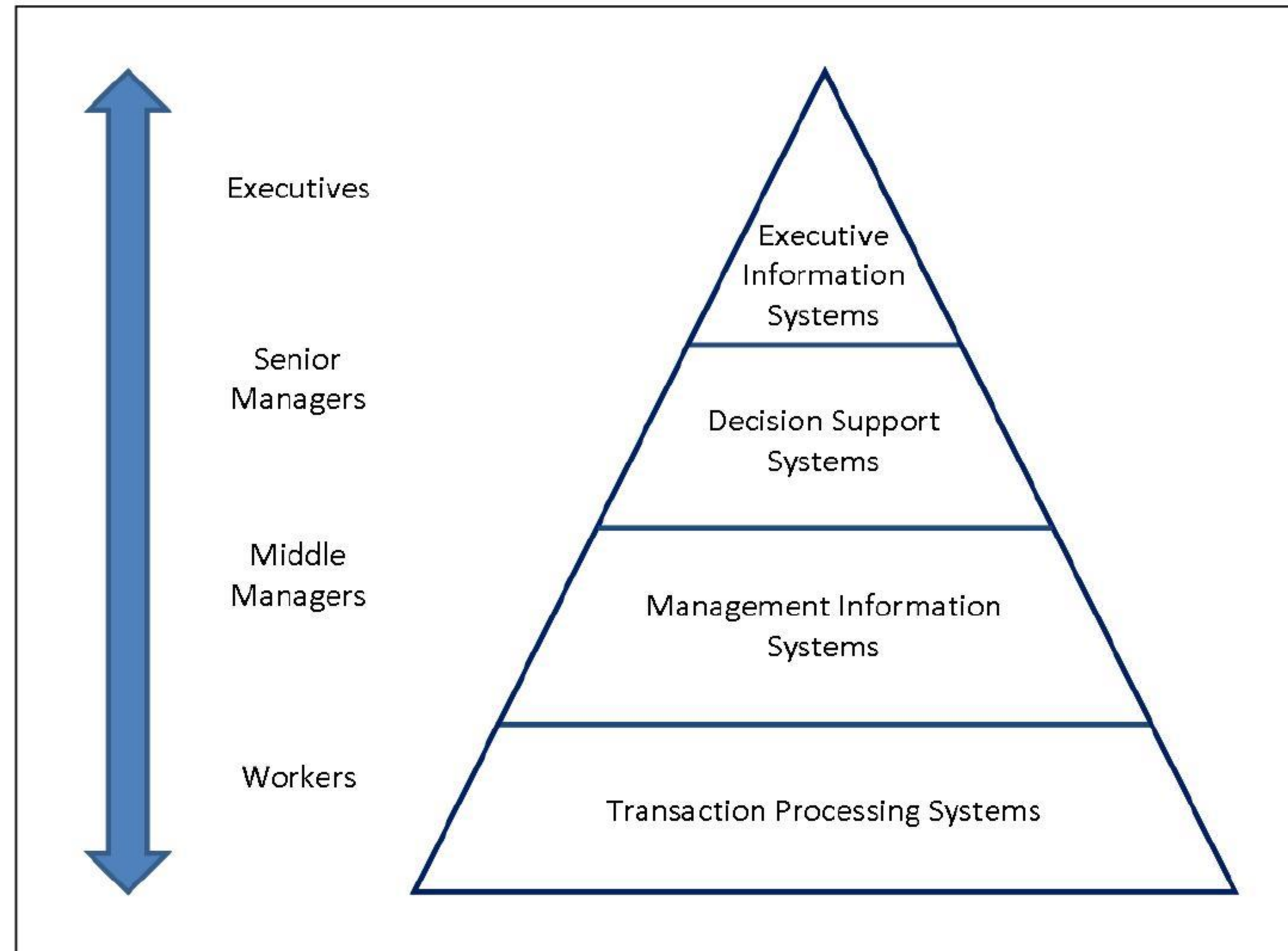


- **Transaction Processing System (TPS)**
- Organized collection of people, procedures, software, devices and databases used to record and complete business transactions
 - Sales, receipts, payroll, paying suppliers
 - Purpose: answer routine questions and track flow of transactions
 - Tasks predefined and highly structured
 - Managers need TPS to monitor the status of internal operations
- **Management Information Systems (MIS)**
- Organized collection of people, procedures, software, databases and devices that provide routine information to managers and decision makers
 - Purpose: operational efficiency
 - Marketing, finance, production
 - Generate reports from data and information supplied by TPS
 - Managers use this to monitor and control the business and predict future performances



- **Decision Support Systems (DSS)**
- Organized collection of people, procedures, software, databases and devices that support problem-specific decision making
 - Use information from TPS and MIS, plus external sources
 - Purpose: solving unique problems, solutions may not be fully predefined
 - Supports decision making process by analysing data and suggesting alternatives
- **Executive Support Systems (ESS)**
 - Used by senior management
 - Judgement, evaluation, insight
 - Information presented through portal in the form of digital dashboard







- **Company: Domino's Pizza**
- **Problem: Customers not happy with home delivery and pizza**
- **Competitive Advantage needed**
 - Good Pizza
 - Excellent customer service
- **Point of sale system – Pulse**
 - Captures purchase and payment data using computers, automated cash registers , scanners etc.
 - Improved customer service, reduced mistakes, shorter training time



- **Pulse Evolution**

- Think client model to thin client model
- networked stations with little processing power collect data
- Info goes to one machine for processing
- Benefit: easier to update and secure

- **Ordering system: Pizza Tracker**

- Simulated photographic version of pizza shown while ordering
- View progress of pizza ordered online
- Improved customer relationship



- **Systems**
 - Point of sale system
 - Online ordering system
- **Business Processes**
 - Purchase and payments at physical locations
 - Managing online orders for pizza
- **Business performance**
 - Help in maintaining consistent and efficient management functions
 - Taking and customizing orders, maintaining sales figures, compiling customer info
- **Online Pizza tracker**
 - Showing photographic version of the pizza and giving view of the progress of the pizza order



- Different kinds of IS in a firm work together
- The challenge to get them all work together as one corporate system (information integration)
- Solution: **enterprise applications (systems)** that span functional areas
 - Executing business processes across the firm
 - coordinate business processes closely



- **Collaboration:** working with others to achieve shared and explicit goals
 - E.g. members in a team collaborate to complete a task
 - Investments in collaborative technologies brought improvements
 - Categories of *Collaborative Software Tools*
 - E-mail and instant messaging
 - Collaborative Writing
 - Event Scheduling
 - Audio Conferencing
 - Video Conferencing
 - White boarding
 - Document sharing (wikis)



- E-mail and Instant Messaging
 - Major communication and collaboration tool
 - IM allows real time conversation with multiple people
- Social Networking
 - Corporate tool for sharing ideas and collaborating
 - LinkedIn.com provides networking services to business professionals
- Wikis
 - Major wiki: Wikipedia
 - Contribute and edit text content and graphics
 - Major repository for unstructured corporate knowledge



- Virtual Meeting Systems

- Reason: to reduce travel costs by business professionals
- Briefing, training courses, management consulting, inspirational chats
- *Telepresence*: integrated audio-video technology that allows the person to give the appearance of being present at the location of meeting





- IS instrument for creating value to firms
- The value of information is directly linked to how it helps decision makers achieve the organization's goals
- Information systems must be applied thoughtfully and carefully so that society and industry can reap maximum benefits.
- Technology usage, how it helps the business
- Globalization and its challenges
- Sociotechnical systems
- Business Information Systems (E-business, Management Level, Enterprise, Collaboration)

Thank You